



Faculty of Mechanical Engineering Kraljevo (MFK) – Serbia

WHO WE ARE:

The Faculty of Mechanical Engineering (FME) – Kraljevo is part of University of Kragujevac in Serbia. It was established as an independent legal entity in 1986, after 16 years of work as Department for Heavy Machinery of the Faculty of Mechanical Engineering of the University of Belgrade. There are seven departments and eleven R&D centres with well-established laboratories. FME usually pursues its main research activities through a number of research centres including the: Centre for Construction and Transport Machinery, Centre for Rail Vehicles, Centre for Technology and Production Systems, Centre for Integrated Development of Products and Processes, Centre for Testing and Materials Joining, Centre for Maintenance, Quality and Technical Diagnostics, Centre for Thermal Technique and Environmental Protection, Centre for Automatic Control and Fluid Technique, Centre for Applied Mechanics and Basic Mechanical Design, Regional Centre for Energy Efficiency Kraljevo, and the Innovation Centre. Research activities in the area of design and the investigation of railway vehicles is carried out within the Railway Vehicles Centre, which is concerned with research in the fields of freight wagon design and investigation.

COLLABORATION INTERESTS:

The Centre for Integrated Development of Products and Processes, the Centre for Testing and Materials Joining and the Centre for the Automatic Control and Fluid Technique are also included in the research activities of the Centre for Railway Vehicles. Within such kind of collaboration, researchers within the centres are interested in projects which involve developing methods of design, calculation and testing of railway vehicles. In the past, these centres have developed methods for the static tests of wagons, torsion stiffness testing, dynamic testing of wagon to crash and testing the brakes of railway vehicles. These are also areas of interest in collaboration in the FP7 programme and other international projects. FME could be either a coordinator or partner in those projects.

AREAS FOR R&D COLLABORATION:

At the moment, the Railway Vehicles Centre has the ability to perform investigations of all static properties of railway vehicles (load tests, braking tests, torques rigidity tests at straight track) and part of the dynamic properties of railway vehicles (complete impact tests, measurements of accelerations, displacements, horizontal forces acting on axis during test rides). The centre's electronic measurement equipment is state-of-the art and specific sensors, that are not present at the market, are developed in cooperation with Wagon Factory in Kraljevo. The centre is involved in the design and production of transducers for different purposes of testing, acquisition and processing of measuring

results. FME makes own application software for calculation and testing of railway vehicles.

MAIN ACHIEVEMENTS:

- Improvement of suspension systems of railway vehicles, 2005-2007.
- Development of new product – four axis freight wagon Eanos with increased axle load, 2003-2005.
- Development of technology for welding of wagon springs, 1997-1998.
- Development and definition of characteristics of components of integral transport, part of the project "Development and definition of characteristics of control, logistic and informational systems and their application in road, waterborne, airborne and integral transport of Serbia, 1997-2000.
- Development of new and improvement of present products and components railway vehicles, part of the project "Investigation and development of products and technologies of heavy machinery," 1997-2000.

WHAT MAKES US A GOOD PARTNER?

The centre is equipped with measuring equipment and testing facilities within its laboratory. It has its own adopted methodologies for testing. During the last decade, market demand for the investigation of railway vehicles and components fatigue grew. While researchers of the Railway Vehicles Centre responded to it, this task comprises also the inclusion of researchers from the Department for Mechanical Structures, Educational Unit of the Faculty, whose professors carry out the research which investigates mechanical structures and components fatigue.

EU PROJECTS:

- Regional railway transport research and training centre foundation, funded by FP6, 2005-2007.
- Strengthening Railway Vehicles Centre of Faculty of Mechanical Engineering Kraljevo (SERVICE), funded by FP7.
- Transport EU-Western Balkan Network for Training, Support and Promotion of Cooperation in FP7 research activities (TRANSBONUS), funded by FP7.

OTHER PROJECTS:

- Research project for the international market: "Investigation of passive system for rotating of freight wagon in order to increase its speed," as partner of ProjektKonsult AB company (Vasteras, Sweden, 1991),
- A national project supported by the Ministry of Science of the Republic of Serbia: "Qualifying and preparation for the accreditation of laboratory testing of Railway Vehicles



Fig 1. Testing facilities – measurement wheel set



Fig.2. Static testing of lower frame

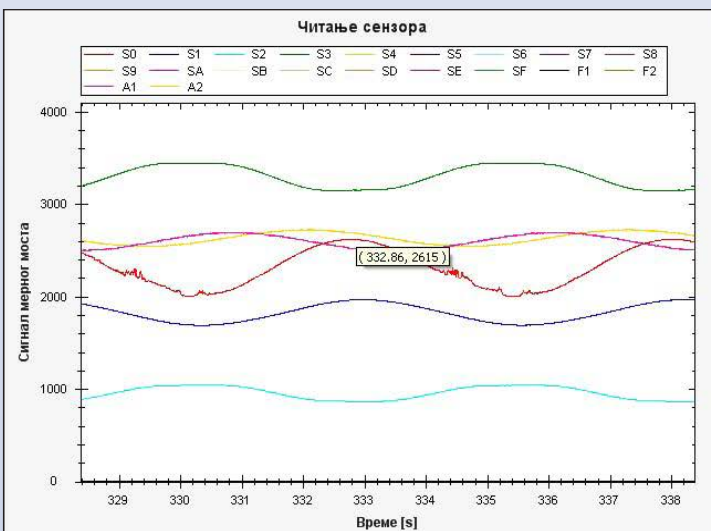


Fig.3. Calibration process of measurement wheel set

in accordance with European standards – support to export.”

- A national project supported by the Ministry of Science of the Republic of Serbia: “Freight wagons suspension system improvement.”

OTHER INFORMATION:

Name of the organisation: Faculty of Mechanical Engineering – Kraljevo

Organisation type: Faculty

Name of the research department: Railway Vehicle Center

Number of researchers: 15

Working languages: Serbian, English

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